

This manual includes:

- ACS 600 initialisation using the Control Panel
- First start
- Rotation direction check
- Start through a digital input
- Speed control using the Control Panel and through an analogue input

## ACS 600 Frequency Converters

equipped with Standard Application Program 5.x



This Guide describes the basic start-up procedure of the ACS 600 frequency converter equipped with the Standard Application Program 5.x.

See the *Firmware Manual for ACS 600 Standard Application Program 5.x* for more information on

- the use of the Control Panel,
- the control connections,
- the Parameters,
- the fault tracing.

3BFE 64049224 R0125  
EN  
EFFECTIVE: 26.08.1998  
SUPERSEDES: None

## START-UP PROCEDURE

### 1 – SAFETY



The start-up procedure must only be carried out by a qualified electrician.

The safety instructions must be followed during the start-up procedure. See the appropriate hardware manual for the safety instructions.

The ACx 600 must not be powered up more than five times in ten minutes to avoid charging resistor overheating (no limitation for ACS 600 MultiDrive and ACx 607 units -0760-3, -0930-5, -0900-6 or above).

- Check the installation before the start-up procedure. See the installation checklist from the appropriate hardware/installation manual.
- Check that starting the motor does not cause any danger.

It is recommended having the driven equipment disengaged when first start is performed if there is the risk of damage to the driven equipment in case of incorrect rotation direction of the motor.

### 2 – POWER-UP

- Apply mains power.** The Control Panel first enters the panel identification data ...

```

CDP312 PANEL   Ux.xx
.....
```

... then the Identification Display of the drive ...

```

ACS 600       xx kW

ID NUMBER 1
```

...and after a few seconds the Control Panel automatically enters the Actual Signal Display.

```

1  ->  0.0 rpm  0
FREQ   0.00 Hz
CURRENT 0.00 A
POWER  0.00 %
```









Drive set-up can be started.

## START-UP PROCEDURE

### 3 – START-UP DATA ENTERING (Parameter Group 99)

- ❑ **Select the language.** The general parameter setting procedure is given below.

The general parameter setting procedure:

- Press **PAR** to select parameter mode.
- Press  or  to scroll Parameter Groups (10 to 99).
- Press  or  to scroll parameters within the Parameter Group.
- Select a new value by **ENTER** (brackets appear around the parameter value) and  or . (Fast change by  or .)
- Press **ENTER** to accept the new value (brackets disappear).

```

1   ->  0.0 rpm  0
99 START-UP DATA
01 LANGUAGE
ENGLISH
    
```

```

1   ->  0.0 rpm  0
99 START-UP DATA
01 LANGUAGE
[ENGLISH]
    
```

- ❑ **Select the Application Macro.** The general parameter setting procedure is given above.

The default value FACTORY is suitable in most cases. A detailed description of the Application Macros is included in *Firmware Manual*.

```

1   ->  0.0 rpm  0
99 START-UP DATA
02 APPLICATION MACRO
[ ]
    
```

- ❑ **Select the motor control mode.** The general parameter setting procedure is given above.

DTC is suitable in most cases. The SCALAR control mode is recommended



- for multimotor drives when the number of motors connected to the ACS 600 is variable.
- when the nominal current of the motor is less than 1/6 of the nominal current of the inverter.
- when the inverter is used for test purposes with no motor connected.

```

1   ->  0.0 rpm  0
99 START-UP DATA
04 MOTOR CTRL MODE
[DTC]
    
```

### START-UP PROCEDURE

Enter the motor data from the motor nameplate.

 							
3 ~ motor		M2AA 200 MLA 4					
		IEC 200 M/L 55				↔	
		No					
		Ins.cl. F			IP 55		
V	Hz	kW	r/min	A	cos φ	I <sub>A</sub> /I <sub>N</sub>	t <sub>E</sub> /s
690 Y	50	30	1475	32.5	0.83		
400 D	50	30	1475	56	0.83		
660 Y	50	30	1470	34	0.83		
380 D	50	30	1470	59	0.83		
415 D	50	30	1475	54	0.83		
440 D	60	35	1770	59	0.83		
Cat. no		3GAA 202 001 - ADA					
6312/C3		6210/C3		180 kg			
IEC 34-1							

380 V  
Mains  
Voltage

**Note:** Set the motor data exactly the same as on the motor nameplate. For example, if the motor nominal speed is 1440 rpm on the nameplate, setting the value of Parameter 99.08 MOTOR NOM SPEED to 1500 rpm results in wrong operation of the drive.

- ❑ Nominal voltage. The general parameter setting procedure is given on Page 2.

Allowed range:  $1/2 \cdot U_N \dots 2 \cdot U_N$  of ACS 600. ( $U_N$  refers to the highest voltage in each of the nominal voltage ranges: 415 VAC for 400 VAC units, 500 VAC for 500 VAC units and 690 VAC for 600 VAC units.)

```
1  ->  0.0 rpm  0
99 START-UP DATA
05 MOTOR NOM VOLTAGE
[ ]
```

- ❑ Nominal current. The general parameter setting procedure is given on Page 2.

Allowed range:  $1/6 \cdot I_{2hd} \dots 2 \cdot I_{2hd}$  of ACS 600

```
1  ->  0.0 rpm  0
99 START-UP DATA
06 MOTOR NOM CURRENT
[ ]
```

- ❑ Nominal frequency. The general parameter setting procedure is given on Page 2.


Range: 8 ... 300 Hz

```
1  ->  0.0 rpm  0
99 START-UP DATA
07 MOTOR NOM FREQ
[ ]
```

- ❑ Nominal speed. The general parameter setting procedure is given on Page 2.

Range: 1 ... 18000 rpm

```
1  ->  0.0 rpm  0
99 START-UP DATA
08 MOTOR NOM SPEED
[ ]
```

<b>START-UP PROCEDURE</b>	
<p><input type="checkbox"/> Nominal power. The general parameter setting procedure is given on Page 2.</p> <p>Range: 0... 9000 kW</p>	<pre>1   -&gt;  0.0 rpm  0 99  START-UP DATA 09  MOTOR NOM POWER [ ]</pre>
<p>When the motor data has been entered a warning appears. It indicates that the motor parameters have been set, and the ACS 600 is ready to start the motor identification (ID magnetisation or ID Run).</p>	<pre>1   -&gt;  0.0 rpm  0  ** WARNING ** ID MAGN REQ</pre>
<p><input type="checkbox"/> Select the motor identification. The general parameter setting procedure is given on Page 2.</p> <p>The default value NO is suitable for most applications. It is applied in this basic start-up procedure.</p> <p>The ID Run (STANDARD or REDUCED) should be selected instead if:</p> <ul style="list-style-type: none"> <li>• Operation point is near zero speed.</li> <li>• Operation at torque range above the motor nominal torque within wide speed range and without any pulse encoder (i.e. without any measured speed feedback) is required.</li> </ul> <p>See the <i>Firmware Manual</i> for the ID Run procedure.</p>	<pre>1   -&gt;  0.0 rpm  0 99  START-UP DATA 10  MOTOR ID RUN [NO]</pre>
<p><b>4 – IDENTIFICATION MAGNETISATION</b> with Motor ID Run selection NO</p>	
<p><input type="checkbox"/> Press the <b>LOC/REM</b> key to change to local control (L shown on the first row).</p> <p>Press the  to start the magnetisation. The motor is magnetised at zero speed for 20 to 60 s. Two warnings are displayed:</p> <ul style="list-style-type: none"> <li>• The upper warning is displayed while the magnetisation is on.</li> <li>• The lower warning is displayed after the magnetisation is completed.</li> </ul>	<pre>1  L-&gt;  0.0 rpm  I  ** WARNING ** ID MAGN  1  L-&gt;  0.0 rpm  0  ** WARNING ** ID DONE</pre>

## START-UP PROCEDURE

### 5 – ROTATION DIRECTION OF THE MOTOR

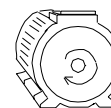
- ❑ Check the rotation direction of the motor.
  - Press **ACT** to get the status row visible.
  - Increase the speed reference from zero to a small value by pressing **REF** and then  $\oplus$  or  $\ominus$  ( $\odot$  or  $\otimes$ ).
  - Press  $\odot$  (Start) to start the motor.
  - Check that the motor is running in the desired direction.
  - Stop the motor by pressing  $\otimes$ .

To change the rotation direction of the motor:

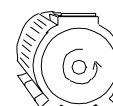
- Disconnect mains power from the ACx 600, and wait 5 minutes for the intermediate circuit capacitors to discharge. Measure the voltage between each input terminal (U1, V1 and W1) and earth with a multimeter to ensure that the frequency converter is discharged.
- Exchange the position of two motor cable phase conductors at the motor terminals or at the motor connection box.
- Verify your work by applying mains power and repeating the check as described above.

```

1 L->[xxx] rpm I
EREG          xxx Hz
CURRENT       xx A
POWER         xx %
```



forward  
direction



reverse  
direction

### 6 – SPEED LIMITS AND ACCELERATION/DECELERATION TIMES

- ❑ Set the minimum speed. The general parameter setting procedure is given on Page 2.
- ❑ Set the maximum speed. The general parameter setting procedure is given on Page 2.
- ❑ Set the acceleration time 1. The general parameter setting procedure is given on Page 2.
 

**Note:** Check also acceleration time 2, if two acceleration times will be used in the application.
- ❑ Set the deceleration time 1. The general parameter setting procedure is given on Page 2.
 

**Note:** Set also deceleration time 2, if two deceleration times will be used in the application.

```

1 L-> 0.0 rpm 0
20 LIMITS
01 MINIMUM SPEED
[ ]
```

```


1 L-> 0.0 rpm 0
20 LIMITS
02 MAXIMUM SPEED
[ ]
```

```

1 L-> 0.0 rpm 0
22 ACCEL/DECEL
02 ACCELER TIME 1
[ ]
```

```

1 L-> 0.0 rpm 0
22 ACCEL/DECEL
03 DECELER TIME 1
[ ]
```

<b><u>START-UP PROCEDURE</u></b>	
<b>7 – STARTING THE DRIVE THROUGH THE I/O INTERFACE</b>	
<p>As default the external start/stop signal is read from the digital input DI1, and the external speed reference from the analogue input AI1.</p> <p>Starting through a digital input:</p> <ul style="list-style-type: none"> <li>• Press the <b>LOC/REM</b> key to change to external control (no L visible on the first row of the panel display).</li> <li>• Switch on digital input DI1.</li> </ul> <p>Drive starts. The motor is accelerated to a speed determined by the voltage level of analogue input AI1.</p>	<p>Valid if the factory macro is selected. See Parameter 99.02 APPLICATION MACRO.</p>
<b>8 – STOPPING THE MOTOR</b>	
<p>Stopping when in local control: Press  .</p> <p>Stopping when in external control: Switch off digital input DI1.</p> <p>Press the <b>LOC/REM</b> key to change between local and external control.</p>	<p>Valid if the factory macro is selected. See Parameter 99.02 APPLICATION MACRO.</p>







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